freestanding flexible conductors substantially compliantly respond when the flexible contact elements are withdrawn from contacting the electronic component.

88. (Added) A method according to any one of claims 33, 34, 36, 37, 42, 43, 49 or 53 to 58 wherein said freestanding flexible conductors comprise a coating.

89. (Added) A structure according to claim 88 wherein said coating is selected from the group consisting of Au, Cr, Co, Ni and Pd.

90. (Added) A structure according to claim 89 wherein said free standing flexible conductor comprises gold, gold alloy, copper, copper alloy, aluminum, nickel, palladium and platinum.

REMARKS

Reconsideration is respectfully requested in view of any changes to the claims and the remarks herein. Please contact the undersigned to conduct a telephone interview in accordance with MPEP 713.01 to resolve any remaining requirements and/or issues prior to sending another Office Action. Relevant portions of MPEP 713.01 are included on the signature page of this amendment.

The specification has been amended to overcome the objection thereto in Section 1 of the Office Action (OA) at page 2 thereof.

Claims 36, 45-49, 52, 55, 59-60, 62 and 64 have been rejected under 35 USC 112, first paragraph. In claim 36, the recitation of "The flexible elements includes a protuberance at an end thereof" is supported throughout the specification, in particular and incorporated US Patent 5,371,654 by original claim 1, line 4-5, which recites "elongated electrical conductor's having a protuberance at one thereof" and the specification teaches "wires to flex under pressure" at page 13, line 4-5 from the bottom. As to claim 45 "probe card" is a term of the art that by the description is supported throughout the

specification. To further the progress of progression of this application for claim 45 has been amended to recite "a structure comprising a probe assembly" and the element "Probe Card" has been deleted from the claim. Claims 46-48 depend from clsim 45.

As to claim 49, the Examiner states that there is no support in the specification for "a plurality of first substrates adopted to be mounted to a second substrate". Applicants respectfully disagree. For example, Figure 16 shows an electrical interconnection structure providing electrical connection from side 81 to side 108. Added Figure 17 (Figure 1 of incorporated US Patent 5,371,654), shows electrical interconnectors 249 and Figure 20 (Figure 4 of incorporated US Patent 5,371,654) shows a plurality of electrical interconnectors 249 on substrate 280. Incorporated US patent 5,371,654 teaches in regards to Fir. 20 (added Fig. 36 herein) "multiple substrates 210 each having a group of wires 212 disposed thereon." The term multiple substrates means a plurality of substrates. Thus, the specification supports a plurality of electrical interconnection structures of Fig. 16 on the substrate 280 in place of the electrical interconnection structures 249 of Fig. 17 and 20. claim 49. Added claim 78 corresponds with "a plurality" changed to "at least one" and added claim 83 corresponds to claim 49 with "a plurality" deleted.

As to claim 52, the Examiner states that there is no support for "there are a plurality of said second substrates mounted to said first substrate." Applicants respectfully disagree for the reasons given above.

Claims 42, 45-48 and 57 have been rejected under 35 USC 112, second paragraph. In regards to claim 42, the Examiner states "it is unclear how the 'socket' is interrelated and associated with the first and second substrates in order to be used as an alignment feature". Claim 42 has been amended to recite "a socket, which electrically interconnects the first substrate and the second substrate in a substantially fixed position with respect to each other" which is essentially the meaning of the term "socket" as understood by a person of skill in the art.

In regard to claim 45, the term "probe card" has been deleted. In regards to claim 47, the term "top structure" has been replaced by "protuberance".

At page 3, paragraph 4, of the Office Action, the Examiner objects to the specification. In response thereto applicants have copied the entire text of US patent 5,371,654, which is incorporated by reference in the specification at pages 6, 7 and 12. (See page 10 of applicants' response dated May 7, 2002.) Figures 17-39 have been added, which are drawings 1-23 of US 5,371,654. No new matter is added.

Claims 29-30, 33-35, 37-44, 50-51, 53-54, 56, 58, 61, 63, have been rejected over Collins at al. Applicants respectfully disagree. The Examiner states that "Collins et al. discloses ... a plurality of flexible contact elements (18) " The Examiner points to no teaching to support this statement. Collins et al. teaches away from applicants' invention. Collins et al. teaches at Col. 3, line 68 to Col. 4, line 2 "The beams 18 elastically compress and **deform** due to axial force" (Emphasis added) and at Col. 5. lines 24-26 "The beam 18 is made of wire which elastically **deforms** and compresses when subjected to axial pressure" (Emphasis added.) and at Col. 6, lines 36-37 "when axial pressure is applied ... the beam 18 elastically compresses and **deforms** ." (Emphasis added." Thus Collins et al teaches away from "compliantly responding" as recited in independent claim 29 and in amended independent claims 34,37, 42 and 43. "Deforming" as taught by Collins at al. is not "compliantly responding" as claimed by applicant.

In view of the changes to the claims and the remarks herein, the Examiner is respectfully requested to reconsider the above-identified application. If the Examiner wishes to discuss the application further, or if additional information would be required, the undersigned will cooperate fully to assist in the prosecution of this application.

Please charge any fee necessary to enter this paper and any previous paper to deposit account 09-0468.

If the above-identified Examiner's Action is a final Action, and if the above-identified application will be abandoned without further action by applicants, applicants file a Notice of Appeal to the Board of Appeals and Interferences appealing the final rejection of the claims in the above-identified Examiner's Action. Please charge deposit account 09-0468 any fee necessary to enter such Notice of Appeal.

In the event that this amendment does not result in allowance of all such claims, the undersigned attorney respectfully requests a telephone interview at the Examiner's earliest convenience.

MPEP 713.01 states in part as follows:

> Where the response to a first complete action includes a request for an interview or a telephone consultation to be initiated by the examiner, ... the examiner, as soon as he or she has considered the effect of the response, should grant such request if it appears that the interview or consultation would result in expediting the case to a final action.

Respectfully submitted,

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APPENDIX

Claims in rewritten form.

30. (Rewritten) A method according to any one of claims 29, 33, 34, 36, 37, 42, 43 or 53 to 60, wherein the electronic device is a semiconductor wafer.

32. (Rewritten) A method according to any one of claims 29, 33, 34, 36, 37, 42, 43 or 53 to 60, wherein the area of the electronic device is a portion of a surface area of the electronic device.

33. (Rewritten) A method of probing an electronic device by contacting the electronic device with a plurality of flexible contact elements, the method comprising the steps of:

providing a first substrate corresponding to an area of the electronic device to be probed, said substrate having a front surface;

mounting and connecting a second substrate to the front surface of the first substrate, said second substrate having a plurality of flexible contact elements bonded to and extending from a surface thereof;

the flexible contact elements substantially compliantly respond when the flexible contact elements are withdrawn from contacting the electronic component;
urging the first substrate and the electronic device towards one another so that the flexible contact elements make contact with the electronic component, and the electronic device is a printed circuit board.

34. (Rewritten) A method of probing an electronic device by contacting the electronic device with a plurality of flexible contact elements, the method comprising the steps of:

providing a first substrate corresponding to an area of the electronic device to be probed, said substrate having a front surface;

mounting and connecting a second substrate to the front surface of the first substrate, said second substrate having a plurality of flexible contact elements bonded to and extending from a surface thereof;

the flexible contact elements substantially compliantly respond when the flexible contact elements are withdrawn from contacting the electronic component;

urging the first substrate and the electronic device towards one another so that the flexible contact elements make contact with the electronic component, and the electronic device is a packaging substrate.

35. (Rewritten) A method according to any one of claims 29, 33, 34, 36, 37, 42, 43 or 53 to 60, wherein the flexible elements are probe elements.

37. (Rewritten) A method of probing an electronic device by contacting the electronic device with a plurality of flexible contact elements, the method comprising the steps of:

providing a first substrate corresponding to an area of the electronic device to be probed, said substrate having a front surface;

mounting and connecting a second substrate to the front surface of the first substrate, said second substrate having a plurality of flexible contact elements bonded to and extending from a surface thereof;

the flexible contact elements substantially compliantly respond when the flexible contact elements are withdrawn from contacting the electronic component;

urging the first substrate and the electronic device towards one another so that the flexible contact elements make contact with the electronic component, and the flexible elements are wires disposed on the surface

of the second substrate, the wires are shaped so that a free end thereof laterally moves when pressed against the area of the electronic device.

38. (Rewritten) A method according to any one of claims 29, 33, 34, 36, 37, 42, 43 or 53 to 60, wherein there are electrical connections between the second substrates and the first substrate.

39. (Rewritten) A method according to any one of claims 29, 33, 34, 36, 37, 42, 43 or 53 to 58, wherein the first substrate is a space transformer.

40. (Rewritten) A method according to any one of claims 29, 33, 34, 36, 37, 42, 43 or 53 to 60, wherein the electronic device is a semiconductor wafer; and the flexible contact elements of the second substrate contact individual semiconductor dies on the semiconductor wafer.

41. (Rewritten) A method according to any one of claims 29, 33, 34, 36, 37, 42, 43 or 53 to 60, wherein the electronic device is a semiconductor wafer; and the flexible contact elements of the second substrate contacts at least one integrated circuit on the semiconductor wafer.

42. (Rewritten) A method of probing an electronic device by contacting the electronic device with a plurality of flexible contact elements, the method comprising the steps of:

providing a first substrate corresponding to an area of the electronic device to be probed, said substrate having a front surface;

mounting and connecting a second substrate to the front surface of the first substrate, said second substrate having a plurality of flexible contact elements bonded to and extending from a surface thereof;

the flexible contact elements substantially compliantly respond when the flexible contact elements are withdrawn from contacting the electronic component;

urging the first substrate and the electronic device towards one another so that the flexible contact elements make contact with the electronic component so that a free end of the flexible contact elements laterally move when pressed against the area of the electronic device, and the second substrate is aligned to the first substrate by a socket which electrically interconnects the first substrate and the second substrate in a substantially fixed position with respect to each other.

43. (Rewritten) A method of probing an electronic device by contacting the electronic device with a plurality of flexible contact elements, the method comprising the steps of:

providing a first substrate corresponding to an area of the electronic device to be probed, said substrate having a front surface;

mounting and connecting a second substrate to the front surface of the first substrate, said second substrate having a plurality of flexible contact elements bonded to and extending from a surface thereof;

the flexible contact elements substantially compliantly respond when the flexible contact elements are withdrawn from contacting the electronic component;

urging the first substrate and the electronic device towards one another so that the flexible contact elements make contact with the electronic component so that a free end of the flexible contact elements laterally move when pressed against the area of the electronic device, and the first substrate with the second substrate mounted thereto is mounted to an electrical testing apparatus.

44. (Rewritten) A method according to any one of claims 29, 33, 34, 36, 37, 42, 43 or 53 to 60, wherein the first substrate with the second substrate mounted thereto is mounted to an electrical testing apparatus by a plurality of electrical connections.

45. (Rewritten) A probe structure comprising an assembly comprising:

a first substrate having a top surface, a bottom surface, a first plurality of terminals disposed on the top surface, and a second plurality of terminals disposed on the bottom surface;

at least one second substrate having a top surface and a bottom surface;

means for effecting electrical connections between the at least one second substrate and the first substrate;

a plurality of probe elements disposed on the top surface of the at least one second substrate; and

the probe elements are free-standing flexible conductors shaped so that a free end thereof laterally movers when pressed against a surface.

46. (Rewritten) A structure according to claim 45, wherein the probe lements are free-standing flexible conductors.

47. (Rewritten) A structure according to claim 45, wherein protuberances are deposed at ends of the plurality of free-standing flexible conductors.

48. (Rewritten) A structure according to claim 45, wherein the free-standing flexible conductor further includes a protuberance at an end thereof.

50. (Rewritten) A method according to any one of claims 29, 33, 34, 36, 37, 42, 43 or 53 to 60, further including plurality of groups of said plurality of the flexible electrical contact elements.

51. (Rewritten) A method according to any one of claims 29, 33, 34, 36, 37, 42, 43 or 53 to 60, wherein there is a least one of said second substrates mounted to said first substrate.

52. (Rewritten) A method according to any one of claims 29, 33, 34, 36, 37, 42, 43 or 53 to 60, wherein there are a plurality of said second substrates mounted to said first substrate.

59. (Rewritten) A probe assembly according to claim 45 wherein said freestanding flexible conductors are shaped to flex and wipe the area of the electronic device, the freestanding flexible conductors substantially compliantly respond when the flexible contact elements are withdrawn from contacting the electronic component.

60. (Rewritten) A structure according to claim 49 wherein said freestanding flexible conductors are shaped to flex and wipe the area of the electronic device, the freestanding flexible conductors substantially compliantly respond when the flexible contact elements are withdrawn from contacting the electronic component.

65. (Added) A structure according to any one of claims 59 or 60, wherein the electronic device is a semiconductor wafer.

66. (Added) A structure according to any one of claims 59 or 60, wherein the area of the electronic device is a portion of a surface area of the electronic device.

67. (Added) A structure according to any one of claims 59 or 60, wherein there are electrical connections between the second substrates and the first substrate.

68. (Added) A structure according to any one of claims 59 or 60, wherein the first substrate is a space transformer.

69. (Added) A structure according to any one of claims 59 or 60, wherein the electronic device is a semiconductor wafer; and the flexible contact elements of the second substrate contact individual semiconductor dies on the semiconductor wafer.

70. (Added) A structure according to any one of claims 59 or 60, wherein the electronic device is a semiconductor wafer; and the flexible contact elements of the second substrate contacts at least one integrated circuit on the semiconductor wafer.

71. (Added) A structure according to any one of claims 59 or 60, wherein the first substrate with the second substrate mounted thereto is mounted to an electrical testing apparatus by a plurality of electrical connections.

72. (Added) A structure according to any one of claims 59 or 60, further including plurality of groups of said plurality of the flexible electrical contact elements.

73. (Added) A structure according to any one of claims 59 or 60, wherein there is a least one of said second substrates mounted to said first substrate.

74. (Added) A structure according to any one of claims 59 or 60, wherein there are a plurality of said second substrates mounted to said first substrate.

75. (Added) A structure according to claim 49 wherein said free standing flexible conductors comprise a coating.

76. (Added) A structure according to claim 75 wherein said coating is selected from the group consisting of Au, Cr, Co, Ni and Pd.

77. (Added) A structure according to claim 76 wherein said free standing flexible conductor comprises gold, gold alloy, copper, copper alloy, aluminum, nickel, palladium and platinum.

78. (Added) A structure comprising:

at least one first substrate adapted to be mounted to a second substrate;

said at least one first substrate has two opposite surfaces;

free standing flexible conductors extending from one of the two surfaces shaped so that a free end thereof laterally movers when pressed against a surface;

terminals on an other of the two opposite surfaces;

means, within each of the first substrates, for connecting the terminals to the contacts; and

said at least one first substrate is mounted on to the second substrate.

79. (Added) A structure according to claim 78 wherein said freestanding flexible conductors comprise a coating.

80. (Added) A structure according to claim 79 wherein said coating is selected from the group consisting of Au, Cr, Co, Ni and Pd.

81. (Added) A structure according to claim 80 wherein said free standing flexible conductor comprises gold, gold alloy, copper, copper alloy, aluminum, nickel, palladium and platinum.

82. (Added) A structure according to claim 78 wherein said freestanding flexible conductors are shaped to flex and wipe the area of the electronic device, the freestanding flexible conductors substantially compliantly respond when the flexible contact elements are withdrawn from contacting the electronic component.

83. (Added) A structure comprising:

a first substrate adapted to be mounted to a second substrate;

the first substrate having two opposite surfaces;

free standing flexible conductors extending from one of the two surfaces shaped so that a free end thereof laterally movers when pressed against a surface;

terminals on an other of the two opposite surfaces;

means, within the first substrate, for connecting the terminals to the contacts; and

the plurality of the first substrates are mounted on to the second substrate.

84. (Added) A structure according to claim 83 wherein said freestanding flexible conductors comprise a coating.

85. (Added) A structure according to claim 84 wherein said coating is selected from the group consisting of Au, Cr, Co, Ni and Pd.

86. (Added) A structure according to claim 85 wherein said free standing flexible conductor comprises gold, gold alloy, copper, copper alloy, aluminum, nickel, palladium and platinum.

87. (Added) A structure according to claim 83 wherein said freestanding flexible conductors are shaped to flex and wipe the area of the electronic device, the freestanding flexible conductors substantially compliantly respond when the flexible contact elements are withdrawn from contacting the electronic component.

88. (Added) A method according to any one of claims 33, 34, 36, 37, 42, 43, 49 or 53 to 58 wherein said freestanding flexible conductors comprise a coating.

89. (Added) A structure according to claim 88 wherein said coating is selected from the group consisting of Au, Cr, Co, Ni and Pd.

90. (Added) A structure according to claim 89 wherein said free standing flexible conductor comprises gold, gold alloy, copper, copper alloy, aluminum, nickel, palladium and platinum.